REMARKS

Claims 1-13 are pending in this application. Claim 1 has been amended. No new matter has been added by way of this amendment because the amendment is supported by the present specification at page 2, lines 16-21.

The specification has been amended at page 3 by inserting paragraphs which merely reiterate the description of the Figures at pages 4-11 of the specification. No new matter has been added.

Based upon the above considerations, entry of the present amendment is respectfully requested.

In view of the following remarks, Applicants respectfully request that the Examiner withdraw all rejections and allow the currently pending claims.

Objection to the Abstract

The Examiner has objected to the Abstract because of certain implied language. Applicants respectfully traverse.

Applicants respectfully refer the Examiner to the amended Abstract, wherein the disputed Abstract language no longer appears. Accordingly, Applicants respectfully request the Examiner to withdraw this objection.

Arrangement of the Specification

Applicants note that portions of the present specification have been amended to include appropriate headings and references to the various Figures.

Issues Under 35 U.S.C. § 112, Second Paragraph

The Examiner has rejected claims 1-5 and 10 under 35 U.S.C. § 112, second paragraph, for indefiniteness. Applicants respectfully traverse.

Applicants respectfully refer the Examiner to claim 1, whereby dimensionally-true sintering of a ceramic pre-shaped item occurs by resting a firing material during the sintering on supports not coated with metal or consisting of metal molten at the sinter temperature, which adapt independently to the shrinkage dimensions which occur during the firing process.

Thus, Applicants respectfully submit that claim 1 recites definite claim language. Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Issues Under 35 U.S.C. § 103(a)

The Examiner has rejected claims 1-5 and 10 under 35 U.S.C. § 103(a) as being unpatentable over Thurnauer et al. (U.S. Patent 3,904,352; hereinafter Thurnauer '352) in view of Tyszblat (U.S.

Patent 5,447,967; hereinafter Tyszblat '967). Applicants respectfully traverse.

The Present Invention and Its Advantages

Ceramic materials are sintered in order to obtain pre-shaped items, such as those used in making dental prostheses. During the sintering process, a volume reduction or shrinkage will take place (as discussed by Applicants in their specification at page 1). Thus, the firing process leads to the sintered object moving relative to a rigid, non-movable firing base. However, this free movability is reduced or hampered by minor hooking effects on the firing base. This hampering leads to a considerable and undesirable deformity of the sintered object.

A conventional method to reduce deformations of the sintered item is to use powders that will reduce the friction between the firing material and the firing base. However, at relatively high sinter temperatures, the powder and firing material will react with each other. Or, at such relatively high temperatures, a caking of the powder fill caused by the development of sinter necks will occur. Thus, there still exist drawbacks in these conventional methods.

As another method, firing bases coated with molybdenum has been employed. However, such processes are unsuitable to make high-

quality ceramic work-pieces because the metal parts contaminate the ceramic.

In contrast to these methods, the present invention has achieved a process that will lead to the dimensionally-true sintering of free-form flat ceramics. Specifically, the present invention is directed to a method of resting the firing material on supporting materials during the sintering. The supports are not coated with metal or consist of metal molten at the sinter temperature. This method leads to independent adaptation to the shrinkage dimensions that occur during the firing process. The present invention has also lead to little or no deformity of the sintered object.

On the other hand, the cited combination of Thurnauer '353 and Tyszblat fails to disclose all features and advantages of the present invention. Further, a *prima facie* case of obviousness has not been established based on the Thurnauer '353 and Tyszblat '967 references.

Distinctions over the Combination of Thurnauer '352 and Tyszblat '967

A *prima facie* case of obviousness has not been made based on the combination of the Thurnauer '353 and Tyszblat '967 references because not all requirements for a *prima facie* case of obviousness have been satisfied.

U.S. case law squarely holds that a proper obviousness inquiry requires consideration of three factors: (1) the prior art reference

(or references when combined) must teach or suggest all the claim limitations; (2) whether or not the prior art would have taught, motivated, or suggested to those of ordinary skill in the art that they should make the claimed invention (or practice the invention in case of a claimed method or process); and (3) whether the prior art establishes that in making the claimed invention (or practicing the invention in case of a claimed method or process), there would have been a reasonable expectation of success. *See In re Vaeck*, 947 F.2d, 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991); *see also In re Kotzab*, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000); *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Napier*, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995) ("Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination.").

In other words, the cited references must disclose or teach all features as claimed. In addition, the references themselves must state the motivation or suggestion to combine the references, and one having ordinary skill in the art must reasonably expect to be successful in achieving the present invention upon reading the references. Here, the cited combination of Thurnauer '352 and Tyszblat '967 do not meet all of these requirements for a *prima facie* case of obviousness.

The Thurnauer '352 reference is directed to an assembly of rollable bodies of heat resistant material and method for supporting ceramics and the like during firing (see Abstract). The Examiner also refers the Applicants to Cols. 3 and 6 of Thurnauer '352. The setter assembly of Thurnauer '352 has several heat-resistant plates **12**, **16** spaced at intervals, as well as heat-resistant balls **8**, **20** (or other rollable elements) (see Col. 3, lines 3-15 and Col. 5, lines 3-7).

However, Applicants respectfully submit that Thurnauer '352 discloses that the other plates, which must be present as they lie directly below the sintered body over a large area, suffer from the same drawback as other conventional assemblies (as Applicants these drawbacks and assemblies in the "Background of the Invention" section of the specification). That is, the static friction between the upper side and the underside of the sintered body **2** leads to undesirable stresses when the shrinkage of plates **12** differs from the shrinkage of the sintered body **2**. Such undesirable stresses lead to deformations of the sintered object.

In contrast to Thurnauer '352, the present invention dispenses with the plates of Thurnauer '352. As mentioned, the present invention places the pre-shaped item (sintered body) as directly resting on the corresponding supports (that are not coated with metal or consisting of metal molten at the sinter temperature), and

independent adaptation to the shrinkage dimensions occurs during the firing process. In other words, the assembly disclosed in Thurnauer '352 is different from the present invention, and the present invention also produces a different product (less deformation).

Thus, the cited Thurnauer '352 reference fails to disclose all features as instantly claimed.

Applicants further submit that the cited Tyszblat '967 reference does not account for the deficiencies of Thurnauer '352. Tyszblat '967 is directed to a translucid, biocompatible ceramic dental prosthesis (see Abstract; claim 1). The Tyszblat '967 reference is being used to disclose a sintered ceramic prosthesis (at page 6 of the Office Action).

(9) However, Applicants respectfully submit that disclosure of ceramic prosthesis does not account for how the Thurnauer '352 assembly is different from that of the present invention. Specifically, the combination of Thurnauer '352 and Tyszblat '967 still leads to static friction between the upper side and the underside of the sintered body **2**, which leads to undesirable stresses (and deformity of the sintered object) when the shrinkage of plates **12** is different to that of the sintered body **2** of the Thurnauer '352 assembly. These stresses still occur when making ceramic dental prothesis. Thus, Tyszblat '967 does not account for the deficiencies of Thurnauer '352, and the cited combination of these two references

do not satisfy the first requirement for a *prima facie* case of obviousness.

Therefore, Applicants respectfully submit that not all requirements for a *prima facie* case of obviousness have been satisfied, including the first requirement of the cited references disclosing all claimed features of the present invention.

Further, Applicants respectfully submit that the cited references fail to provide the requisite motivation and reasonable expectation of success that one skilled in the art needs in order to achieve the present invention.

There are three possible sources of motivation to combine references: the nature of the problem to be solved, the teaching of the prior art, and the knowledge of persons of ordinary skill in the art. *In re Rouffet,* 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998). Here, neither Thurnauer '352 or Tyszblat '967 disclose all features as instantly claimed. While a reference need not expressly teach that the disclosure contained therein should be combined with another, *see Motorola, Inc. v. Interdigital Tech. Corp.*, 43 USPQ2d 1481, 1489 (Fed. Cir. 1997), the showing of combining references "must be clear and particular". *See In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). There is no clear guidance in Thurnauer '352 or Tyszblat '967 that would motivate one skilled in the art to produce the present invention. Instead, one

skilled in the art would use an assembly that makes a sintered object which would have more deformities or drawbacks that when using the present invention.

Thus, Applicants respectfully submit that the present invention is patentably distinct from the cited combination of Thurnauer '352 and Tyszblat '967. Further, the cited combination fails to satisfy all requirements to make a *prima facie* case of obviousness. Accordingly, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Issues Under 35 U.S.C. § 102(b)

The Examiner has rejected claims 1, 3, 4, 5 and 10 under 35 U.S.C. § 102(b) as being anticipated by Thurnauer '352. Applicants respectfully traverse.

As mentioned, the Thurnauer '352 reference fails to disclose all features as instantly claimed. Because "a claim is only anticipated if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," the cited Thurnauer '352 reference cannot be a basis for a rejection under § 102(b). *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Thus, because of the lack of disclosure of all claimed features, the rejection in view of Thurnauer '352 is overcome.

Based on the above comments, Applicants respectfully submit that the present invention is patentable over the cited references, and combinations thereof. Thus, Applicants respectfully request the Examiner to withdraw all rejections and allow the currently pending claims.

A full and complete response has been made to all issues as cited in the Office Action. Thus, Applicants respectfully request that the Examiner pass the application to issue.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Eugene T. Perez (Reg. No. 48,501) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By _____
Andrew D. Meikle, #32,868

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

ADM/ETP
0475-0193P

Attachment: Version with Markings to Show Changes Made

(Rev. 02/20/02)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE ABSTRACT OF THE DISCLOSURE:

The Abstract of the Disclosure has been amended as follows:

[The invention relates to a] A process for the dimensionally-true sintering of ceramic [pre-shape] pre-shaped items, in which the firing material is resting during sintering on supporting devices, not coated with metal, which independently adapt to the shrinkage dimensions which occur during the firing process or allow a contact-free support of the pre-shaped items.

IN THE SPECIFICATION:

The paragraph heading on page 15, line 1, has been deleted.

A paragraph heading has been added before the paragraph beginning on page 1, line 7.

A paragraph heading has been added before the paragraph beginning on page 2, line 11.

Paragraphs have been added before the paragraph beginning on page 3, line 18.

IN THE CLAIMS:

The claims have been amended as follows:

1. (Twice Amended) A process for the dimensionally-true sintering of ceramic pre-shaped items, said process comprising:

resting a firing material during the sintering on supports not coated with metal or consisting of metal molten at the sinter temperature, which adapt independently to the shrinkage dimensions which occur during the firing [process or allow a contact-free support of the pre-shaped items.] process.